

COMMERCIAL LUNAR COMMUNICATIONS AND NAVIGATION REQUEST FOR STUDY INFORMATION

Synopsis – 15 August 2008

General Information

Solicitation Number: TBD
Posted Date:
FedBizOpps Posted Date:
Original Response Date:
Current Response Date:
Classification Code:
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Contracting Office Address

Description

THIS IS NOT A REQUEST FOR PROPOSAL, QUOTATION, OR INVITATION TO BID NOTICE.

A. Request Summary

The National Aeronautics and Space Administration (NASA) plans to establish science stations on the lunar surface beginning in 2013-2014, followed by human return to the Moon and establishment of the first lunar outpost beginning in 2020. Communications, networking, and navigation capabilities required to support these efforts could be provided by the U.S. Government (USG), other international space agencies participating in the Science and Exploration initiatives, or by private companies. NASA is seeking information regarding the extent of interest in commercially provided Communications, Networking, and/or Position, Navigation, and Timing (PNT) (abbreviated as Communications and Navigation or C&N) capabilities or services supporting the development and growth of exploration, scientific, commercial, and other capabilities on the Moon over the next 25 years, consistent with international law.

In accordance with 15.201 (e), the information requested is for planning purposes only and is not intended to bind the USG.

B. Background

NASA's Science Mission Directorate (SMD) has proposed the creation of an International Lunar Network (ILN) beginning as early as 2013-2014. The objective of the ILN is to establish a "science network" of surface stations. The data returned from these ILN surface stations will enable construction of detailed three-dimensional computer models of the internal composition and dynamics of the Moon. Each station will simultaneously operate a group of geophysical measurement instruments (e.g., seismometers and heat flow sensors). Stations will be placed at diverse locations on the Moon for periods of six to eight years. The space agencies of other countries have been invited to become partners in the ILN and their participation is being studied concurrently with this Request for Study Information (RFI). The diversity of surface sites may include far side locations or power-constrained communications subsystems that will drive the need for lunar orbiting data relay and tracking capabilities. Interoperability of communications and data transmissions between the participants' lunar stations and their ground systems is a goal to enable flexibility in defining partner contributions, to open the exchange and integration of information, and to enhance the probability of mission success.

NASA's Exploration Systems Mission Directorate (ESMD) is developing the launch vehicles, space transportation, and selected lunar surface systems supporting Human Lunar Return (HLR) by 2020 in accordance with the U.S. Space Exploration Policy and the NASA Authorization Act of 2005 [PL 109-55]. NASA has determined that the Exploration Architecture should establish an outpost at a polar location that can support long duration missions while also possessing the capability to perform short duration sortie missions that can reach anywhere on the surface. NASA empowered by both PL 109-55 and the U.S. Space Exploration Policy, is interested in both commercial and international participation in exploration. As part of its plan in pursuit of these goals, NASA seeks with this RFI to learn the level of commercial interest in lunar C&N. A paper describing the results of the 2007 Lunar Architecture Team (LAT) Phase 2 C&N study can be downloaded from the public Space Communication and Navigation (SCaN) web site at:

https://www.spacecomm.nasa.gov/spacecomm/programs/system_planning/default.cfm [NASA's Lunar Space Communication and Navigation Architecture \(LAT2 2007\)](#) (June 2008, PDF, 2.8 MB)

The Space Communications and Navigation (SCaN) Office within the Space Operations Mission Directorate manages and directs the ground

and space-based facilities and user services provided to Science and Exploration missions by the existing Near Earth Network, Deep Space Network, and geosynchronous Space Network, and is responsible for establishing the future space communications Lunar Network (LN). [Note that the SCA N Lunar Network and SMD International Lunar Network are completely different]. The scope of the lunar network (LN) is still being developed but may include: lunar orbiting C&N satellites, ground stations to control the network, and lunar surface wired and wireless C&N systems. The combination of lunar Science through the ILN Program and lunar Exploration through the Constellation Program offers an evolutionary growth path for C&N capabilities over the next two decades. To meet the anticipated needs of NASA's lunar science and exploration missions, the SCA N Office will examine the potential for commercial opportunities for lunar C&N capabilities and services.

C. Description of Anticipated Capabilities and/or Services

The SCA N Office anticipated capabilities in support of the NASA lunar exploration program include:

- (1) The capability to provide initial lunar C&N services to support SMD's ILN Program. Depending on the definition of ILN requirements, this capability may be needed as early as 2013.
- (2) The capability to provide "essential C&N" to support ESMD's human exploration of the Moon. Depending on the definition of Exploration requirements, this capability may be required as early as 2018. To determine the magnitude of the commercial opportunity, the extent of commercial communications and navigation capabilities available to augment NASA services and capabilities must be determined. This has also been referred to as "basic" or "initial" C&N and is intended to address the capability that will be provided by NASA rather than an external partner. NASA invites industry comment on defining "essential C&N."

The lunar C&N capabilities will be provided by NASA, other national space agency or agencies, private industry, or some combination of these options. NASA's goals in all scenarios are to maximize interoperability between participants' C&N capabilities and to provide a well defined evolutionary path that maximizes continued support for future Science and Exploration missions.

D. Information Requested

Through this Request For Study Information, the Government desires to improve its understanding of private industry's ability and interest to provide the anticipated capabilities and/or services. This Request For

Study Information is one step of a larger study plan during 2008, that will culminate in a final NASA report that will address aspects of commercial codevelopment of lunar C&N. No Request For Proposals (RFP) is anticipated to directly follow this RFI; however, NASA reserves the right to issue an RFP in the future if the study concludes that commercial lunar C&N capabilities are likely to benefit NASA. It is emphasized that this Request For Study Information is for planning and information purposes only and is NOT to be construed as a commitment by the Government to enter into a contractual agreement, nor will the Government pay for information solicited. This RFI is open to international submissions.

No solicitation exists; therefore, do not request a copy of the solicitation. If a solicitation is released, it will be synopsized in FedBizOpps and on the NASA Acquisition Internet Service.

This study plan can be downloaded from the public SCan web site at: https://www.spacecomm.nasa.gov/spacecomm/programs/system_planning/default.cfm [Commercial Lunar Communication and Navigate Study Plan for RFI \(August 2008, PDF, 2 MB\)](#)

Respondents are requested to provide information that addresses all or any subset of the following topics:

1. What communications, networking, and/or navigation services or capabilities would you be interested in providing to NASA or should otherwise be available on a commercial basis over the next 20 years to meet the initial and/or expanded lunar C&N needs?
2. What is your organization's perspective on the commercial lunar C&N market over the next 20 years?
3. Keeping in mind NASA's requirement to address human safety and mission assurance, how should "essential C&N" be defined to maximize commercial opportunity?
4. What type(s) of investment and/or procurement approaches or mechanisms would you recommend be used?
5. What international collaboration might you pursue or otherwise recommend to meet NASA and international needs for lunar C&N capabilities and services?
6. In light of existing treaty obligations and legislation, what perceived barriers to commercial activity (e.g., legal (Reference Material: The Outer Space Treaty of 1967: <http://history.nasa.gov/1967treaty.html>), contractual, programmatic, organizational, or technical) may limit your ability to offer commercial C&N capabilities and services to NASA? What approach(es) would you recommend to mitigate those barriers?
7. What enablers of commercial activity would enhance your or others' ability to offer commercial C&N capabilities and services to NASA?

What approach(es) would you recommend to foster these enablers?

8. What demonstrations do you envision to show capabilities and mitigate NASA's risks of using commercial C&N capabilities and services?
9. What other strategies or approaches do you recommend that NASA pursue that would contribute to successful cooperation between NASA, industry and/or other entities to create commercial lunar capabilities?

For purposes of this Request For Study Information, capabilities or services may include but are not limited to: terrestrial network services; terrestrial ground stations; Earth-orbiting capabilities; lunar orbiting capabilities; and lunar surface capabilities. Capabilities may be complete "turnkey" services; subsystems or components; partial solutions such as applications for specific functions; or other capabilities believed to be necessary to meet a portion of the anticipated needs.

NASA does not require proprietary information; however, if the respondent submits proprietary material it must be clearly marked with a protective legend and submitted in a file separate from nonproprietary information. The Government will safeguard the confidentiality of any material marked as "Proprietary." NASA contractors under NonDisclosure Agreements may review material on NASA's behalf. Classified material may also be submitted with appropriate markings and prior arrangements, made by contacting the NASA SCan point of contact (POC) listed below. Classified responses must be accompanied by an unclassified abstract.

NASA invites potential responders to submit their response to this Request For Study Information by 4:00 PM EDT on 15 September 2008.

The NASA SCan Office will evaluate and maintain a database of the information from this Request For Study Information for applicability to future missions and acquisitions.

The NASA SCan Office will conduct a one-day workshop on 8 September 2008, near NASA Headquarters in Washington, D.C. for NASA to discuss its approach in more detail and for respondents to present their submissions and discuss questions both in an open forum and, if requested, in a confidential setting. Any organization interested in attending this workshop should sign up no later than 29 August 2008 at the public SCan web site at:

https://www.spacecomm.nasa.gov/spacecomm/programs/system_planning/default.cfm

E. Summary of Key Information

Limit submission to no more than 30 pages.

Submission medium: CD or email containing information in searchable PDF format. No hard copy is required.

Number of copies required: One (1) copy of the CD or email is required.

Due date: 15 September 2008, 4:00 pm EDT

Address for submission of information: Barbara Adde, NASA HQ/Mail Suite 7L70, 300 E St., SW, Washington, DC 20546-0001

NASA SCaN point of contact (POC) concerning this program: Barbara Adde, Policy & Strategic Communications Manager, Space Communications and Navigation Office, Space Operations Mission Directorate, National Aeronautics and Space Administration, Washington, DC 20546-0001. Telephone: (202) 358-1912. FAX: (202) 358-2830. E-mail: Barbara.Adde@nasa.gov.

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